

**CLAIMS:**

1. An acoustic coupler for use with an ultrasound probe for imaging an anatomical structure, comprising a member that is capable of being sterilized, is acoustically neutral, and is in vivo biocompatible, and comprises:
  - (a) a first surface adapted to receive and fix the position of an ultrasound probe head relative to the member, to ensure the correct orientation of the probe head in relation to the anatomical structure during imaging; and
  - (b) a second surface opposed to the first surface, the second surface being shaped to substantially conform to the contour of the anatomical structure.
2. An acoustic coupler according to claim 1, wherein the member is a solid.
3. An acoustic coupler according to claim 1, wherein the member is at least a partially deformable semi-solid.
4. An acoustic coupler according to claims 2 or 3, wherein the member is comprised of gelatine.
5. An acoustic coupler according to claims 2 or 3, wherein the member is comprised of agar.
6. An acoustic coupler according to claims 2 or 3, wherein the member is comprised of alginate.
7. An acoustic coupler according to claims 2 or 3, wherein the member is comprised of a saline solution, and the solution is encased in a bag.

8. An acoustic coupler according to claim 1, wherein the second surface of the member has a concave groove and the anatomical structure is an artery.
9. An acoustic coupler according to claim 8, wherein the anatomical structure is an aorta.
10. An acoustic coupler according to claim 8, wherein the anatomical structure is an aortic arch.
11. An acoustic coupler according to claim 1, wherein the ultrasound coupler is adapted for intraoperative use.
12. An acoustic coupler according to claim 1, further comprising a sheath that is waterproof and capable of being sterilized, having a top end and a bottom end, wherein the top end of the sheath is adapted to provide a generally watertight closure and the bottom end is attached to the first surface of the member.
13. An acoustic coupler according to claim 12, wherein the sheath is transparent and comprised of polyvinyl chloride.
14. An acoustic coupler according to claim 12, wherein the top end of the sheath includes a drawstring to provide the generally watertight closure.
15. An ultrasound probe assembly for imaging an anatomical structure, comprising:
  - (a) a probe head;
  - (b) an ultrasonic transducer housed by the probe head; and
  - (c) a member that is capable of being sterilized, is acoustically neutral and in vivo biocompatible, comprising:
    - (i) a first surface adapted to receive and fix the position of the ultrasound probe head relative to the member, to

ensure the correct orientation of the probe head in relation to the anatomical structure during imaging; and  
(ii) a second surface opposed to the first surface, the second surface being shaped to substantially conform to the contour of the anatomical structure.

16. An ultrasound probe assembly according to claim 15, further comprising a sheath that is waterproof and capable of being sterilized, having a top end and a bottom end, wherein the top end of the sheath is adapted to provide a generally watertight closure and the bottom end is attached to the first surface of the member.

17. A method of producing an ultrasonic image of an anatomical structure, comprising the steps of:

(a) providing an ultrasound probe head with a surface for transmitting and receiving ultrasonic energy;

(b) providing a member that is acoustically neutral and in vivo biocompatible, comprising:

(i) a first surface having a depression to receive and fix the position of the ultrasound probe head relative to the member, to ensure the correct orientation of the probe head in relation to the anatomical structure during imaging; and

(ii) a second surface opposed to the first surface, the second surface being shaped to substantially conform to the contour of the anatomical structure,

(c) ensuring that the member at least is sterile;

(d) placing the probe head into the depression on the first surface of the member;

(e) placing the member onto the anatomical structure to be imaged; and

(f) transmitting and receiving ultrasonic energy to and/or from the anatomical structure through the member.

18. A method as claim d in claim 17, which includes providing a member with a sheath extending from the first surface of the member, and enclosing the ultrasound probe head in the sheath, to prevent contact of the ultrasound probe head with the patient.

19. A method as claimed in claim 17 or 18, which includes providing a plurality of members, wherein each member has a second surface which is at least partially a cylindrical surface and wherein the diameters of the cylindrical surfaces are different, and wherein the method includes selecting a member having a second surface providing the best match to the anatomical structure to be imaged.